



**Federal Communications Commission
Office of Engineering and Technology
Laboratory Division**

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INTERIM PLANS TO APPROVE U-NII DEVICES OPERATING IN THE 5470 – 5725 MHz BAND WITH RADAR DETECTION AND DFS CAPABILITIES¹

The FCC, NTIA, FAA and industry are working to resolve interference to Terminal Doppler Weather Radar (TDWR) systems used near airports that has occurred from some outdoor wireless systems operating in the 5470 MHz – 5725 MHz band. These wireless devices are subject to § 15.407 of our rules and when operating as a master device they are required to implement radar detection and Dynamic Frequency Selection (DFS) functions. We are continuing our work to develop long-term equipment authorization test procedures that will ensure that the devices comply with our rules that include protecting the TDWR operations. In the interim, the Commission will allow certification of wireless master devices with radar detection function and DFS capability, if they meet the following conditions:

- Devices will not transmit on channels which overlap the 5600 – 5650 MHz band.²
- Devices intended for outdoor use will be further restricted, as follows:
 - Devices must be professionally installed when operating in the 5470 – 5725 MHz band;³
 - Grantees must provide owners, operators and all such installers with specific instructions in their user's manual on requirements to avoid interference to TDWRs and information that meets the following instructions:
 - Any installation of either a master or a client device within 35 km of a TDWR location shall be separated by at least 30 MHz (center-to-center)⁴ from the TDWR operating frequency (as shown in the table 1);⁵ and

¹ The Commission revised the rules for U-NII devices (FCC 14-30) operating under Part 15 Subpart E (“new rules”) with an effective date of June 2, 2014. These rules establish new standards for U-NII devices operating in 5470 – 5725 MHz band, among other changes to the U-NII rules. As explained in KDB Publication 905462, until June 1, 2015 new devices can be approved under the rules effective prior to June 2, 2014 and may use the guidance in this KDB. For other transition guidance see KDB Publication 926956.

² The devices subject to the requirements in this KDB can select the initial channel for operation to avoid TDWRs and apply the Uniform Channel Spreading requirements (see FCC 06-96 in ET Docket 03-122 released June 30, 2006) on the remaining available frequency band of operation. For further information see KDB Publication 905462 D01.

³ The grantee must identify the specific expertise and the training required by the installers for installing these types of devices.

⁴ In some instances it is possible that a device may be within 35 km of multiple TDWRs. In this case the device must ensure that it avoids operation within 30 MHz for each of the TDWRs. This requirement applies even if the master is outside the 35 km radius but communicates with outdoor clients which may be within the 35 km radius of the TDWRs.

- Procedures for the installers and the operators on how to register the devices in the industry-sponsored database with the appropriate information regarding the location and operation of the device and installer information is included.⁶
- Devices must meet all of the other requirements specified in § 15.407, and is prohibited from including configuration controls (*e.g.*, country code settings or other options to modify DFS functions) to change the frequency of operations to any frequency other than those specified on the grant of certification for U.S. operation.⁷
- All applications for equipment authorization must clearly show compliance with all of the technical requirements under worst case parameters, under user or operator control, based on frame rates, listen/talk ratios and user data transfer conditions.

All the devices subject to the DFS requirements must be submitted to the Commission's Laboratory Division for pre-grant testing and equipment authorization.⁸ The applicant must ensure that all equipment authorization applications subject to this interim procedure include appropriate attestations that the device has no option to change the DFS parameters and that transmissions are disabled at least in the 5600 – 5650 MHz band. The application must include the user's manual with the appropriate installation and operational requirements for the installers and operators.

We are continuing to evaluate additional measures that may need to be taken to further ensure against interference caused by 5 GHz outdoor wireless systems located near airports. While manufacturers have an obligation to ensure that their equipment complies with FCC rules, and must take steps to ensure their devices are unlikely to cause harmful interference, § 15.5 of the Commission's rules also places an obligation on users of devices to avoid causing interference and to correct any interference that may occur. We encourage manufacturers to include information for the users, including the operators and installers, to ensure that they understand that it is incumbent on them to cooperate with manufacturers to implement any changes necessary to facilitate compliance.⁹

⁵ The requirement for ensuring 30 MHz frequency separation is based on the best information available to date. If interference is not eliminated, a distance limitation based on line-of-sight from TDWR will need to be used. In addition, devices with bandwidths greater than 20 MHz may require greater frequency separation.

Devices may be optionally designed not to transmit on channels which overlap 5570 – 5680 MHz instead of requiring installers to perform site-by-site adjustments. In that case it is still required that the devices should be installed professionally and the procedures for registering the device in the industry database should be included in the User's Manual.

⁶ A voluntary Wireless Internet Service Providers Association (WISPA[®]) sponsored database has been developed that allows operators and installers to register the location information of the U-NII devices operating outdoors in the 5470 – 5725 MHz band within 35 km of any TDWR location (see <http://udia.spectrumbridge.com/udia/home.aspx>). This database may be used by government agencies in order to expedite resolution of any interference to TDWRs.

⁷ For example, device software must not have any country code options or software configuration settings which allow an end user to modify the DFS operation or impact the performance of DFS. See KDB Publication 594280.

⁸ The TCBs are permitted to approve transmitters with radar detection capabilities under the Permit-but-Ask procedures; such devices must be submitted to the FCC for pre-grant testing. See KDB Publication 388624 D02.

⁹ The manufacturers may consider taking steps providing clear instructions to operators and installers of devices as to the need to comply with rules for use of the band, guidance on registration of devices and any other processes that are designed to avoid interference. They may use methods that include, but are not limited to, instructions in manuals, notification on product web pages and service bulletins issued for products in the field.

Table 1: TDWR Location Information*

STATE	CITY	LONGITUDE	LATITUDE	FREQUENCY	TERRAIN ELEVATION (MSL) [ft]	ANTENNA HEIGHT ABOVE TERRAIN [ft]
AZ	PHOENIX	W 112 09 46	N 33 25 14	5610 MHz	1024	64
CO	DENVER	W 104 31 35	N 39 43 39	5615 MHz	5643	64
FL	FT LAUDERDALE	W 080 20 39	N 26 08 36	5645 MHz	7	113
FL	MIAMI	W 080 29 28	N 25 45 27	5605 MHz	10	113
FL	ORLANDO	W 081 19 33	N 28 20 37	5640 MHz	72	97
FL	TAMPA	W 082 31 04	N 27 51 35	5620 MHz	14	80
FL	WEST PALM BEACH	W 080 16 23	N 26 41 17	5615 MHz	20	113
GA	ATLANTA	W 084 15 44	N 33 38 48	5615 MHz	962	113
IL	MCCOOK	W 087 51 31	N 41 47 50	5615 MHz	646	97
IL	CRESTWOOD	W 087 43 47	N 41 39 05	5645 MHz	663	113
IN	INDIANAPOLIS	W 086 26 08	N 39 38 14	5605 MHz	751	97
KS	WICHITA	W 097 26 13	N 37 30 26	5603 MHz	1270	80
KY	COVINGTON CINCINNATI	W 084 34 48	N 38 53 53	5610 MHz	942	97
KY	LOUISVILLE	W 085 36 38	N 38 02 45	5646 MHz	617	113
LA	NEW ORLEANS	W 090 24 11	N 30 01 18	5645 MHz	2	97
MA	BOSTON	W 070 56 01	N 42 09 30	5610 MHz	151	113
MD	BRANDYWINE	W 076 50 42	N 38 41 43	5635 MHz	233	113
MD	BENFIELD	W 076 37 48	N 39 05 23	5645 MHz	184	113
MD	CLINTON	W 076 57 43	N 38 45 32	5615 MHz	249	97
MI	DETROIT	W 083 30 54	N 42 06 40	5615 MHz	656	113
MN	MINNEAPOLIS	W 092 55 58	N 44 52 17	5610 MHz	1040	80
MO	KANSAS CITY	W 094 44 31	N 39 29 55	5605 MHz	1040	64
MO	SAINT LOUIS	W 090 29 21	N 38 48 20	5610 MHz	551	97
MS	DESOTO COUNTY	W 089 59 33	N 34 53 45	5610 MHz	371	113
NC	CHARLOTTE	W 080 53 06	N 35 20 14	5608 MHz	757	113
NC	RALEIGH DURHAM	W 078 41 50	N 36 00 07	5647 MHz	400	113
NJ	WOODBIDGE	W 074 16 13	N 40 35 37	5620 MHz	19	113
NJ	PENNSAUKEN	W 075 04 12	N 39 56 57	5610 MHz	39	113
NV	LAS VEGAS	W 115 00 26	N 36 08 37	5645 MHz	1995	64
NY	FLOYD BENNETT FIELD	W 073 52 49	N 40 35 20	5647 MHz	8	97
OH	DAYTON	W 084 07 23	N 40 01 19	5640 MHz	922	97
OH	CLEVELAND	W 082 00 28	N 41 17 23	5645 MHz	817	113
OH	COLUMBUS	W 082 42 55	N 40 00 20	5605 MHz	1037	113
OK	AERO. CTR TDWR #1	W 097 37 31	N 35 24 19	5610 MHz	1285	80
OK	AERO. CTR TDWR #2	W 097 37 43	N 35 23 34	5620 MHz	1293	97
OK	TULSA	W 095 49 34	N 36 04 14	5605 MHz	712	113
OK	OKLAHOMA CITY	W 097 30 36	N 35 16 34	5603 MHz	1195	64
PA	HANOVER	W 080 29 10	N 40 30 05	5615 MHz	1266	113
PR	SAN JUAN	W 066 10 46	N 18 28 26	5610 MHz	59	113
TN	NASHVILLE	W 086 39 42	N 35 58 47	5605 MHz	722	97
TX	HOUSTON INTERCONTL	W 095 34 01	N 30 03 54	5605 MHz	154	97
TX	PEARLAND	W 095 14 30	N 29 30 59	5645 MHz	36	80

TX	DALLAS LOVE FIELD	W 096 58 06	N 32 55 33	5608 MHz	541	80
TX	LEWISVILLE DFW	W 096 55 05	N 33 03 53	5640 MHz	554	31
UT	SALT LAKE CITY	W 111 55 47	N 40 58 02	5610 MHz	4219	80
VA	LEESBURG	W 077 31 46	N 39 05 02	5605 MHz	361	113
WI	MILWAUKEE	W 088 02 47	N 42 49 10	5603 MHz	820	113

* Latitude and Longitude are specified in NAD 83

- Last updated July 30, 2010
- Rev. Note (July 30, 2010) – Adjusted coordinates and Elevation Information for Charlotte, NC

Change Notice:

06/03/2014: 443999 D01 Approval of DFS UNII Devices v01 is replaced by 443999 D01 Approval of DFS UNII Devices v01r01. Footnote 1 was added to reference the revised U-NII rules.

08/14/14: 443999 D01 Approval of DFS UNII Devices v01r01 is replaced by 443999 D01 Approval of DFS UNII Devices v01r02. Corrected references to other KDB Publications.

09/23/14: 443999 D01 Approval of DFS UNII Devices v01r02 is replaced by 443999 D01 Approval of DFS UNII Devices v01r03. Corrected the URL in footnote 6.